

ABSTRACT OF THE DISCLOSURE

An amplifier. In the illustrative embodiment, the amplifier includes a
5 monolithic semiconductor substrate and an array disposed on said substrate for
coherently receiving and retransmitting electromagnetic energy. In a specific
embodiment, the array is implemented with a plurality of cells. Each of the cells
includes a dual polarization antenna structure for receiving electromagnetic energy
and an amplifier connected thereto. A reflective mode implementation of the present
10 teachings includes an amplifier comprising an ortho-mode feed and a reflective
amplifier array adapted to be illuminated by the feed with an input wavefront with a
first polarization and to return thereto an amplified wavefront with a second
polarization orthogonal to the first wavefront. Another novel aspect of the invention
derives from the provision of first and second mirrors dual shaped mirrors for
15 illuminating the array with a planar wavefront and converting the reflected planar
wavefront to a spherical wavefront. A transmissive mode implementation of the
invention includes an array of unit cells with each unit cell having a receiving antenna
and a power amplifier. At least some of the cells have a transmit antenna adapted to
send a wavefront in the direction of a received wavefront or in a controlled direction.